

Linzer biol. Beitr.	26/2	965-990	30.12.1994
---------------------	------	---------	------------

New Taxa in *Allium* L. subg. *Melanocrommyum* (WEBB et BERTH.) ROUY from Central Asia

F.O. KHASSANOV & R.M. FRITSCH

Abstract: Six sections, thirteen subsections, and five species are newly described or amended including short characterisations of the species. Two new combinations are made, and remarks are given on the lectotypes of four species.

1 Introduction

The genus *Allium* has one of its main centres of diversity in the mountainous regions of Central Asia. During the last twenty years many areas in the former Soviet part have been visited for their *Allium* taxa by different botanists. A better knowledge about this group has been accumulated, and new species as well as new sections and subsections are described now (KAMELIN 1973, 1976a, 1976b, 1980; FRITSCH, 1992, 1993; GAFFAROV & TURAKULOV 1991; KHASSANOV 1992, in prep.; KHASSANOV & MALTZEV 1988; KRASSOVSKAJA & LEVICHEV 1986; TURAKULOV 1986; SEISUMS 1992). The number of species accepted for this region exceeds 200 now (KHASSANOV, in preparation), and the time is due to draw conclusions based on the living plants observed in the nature on many "loci classici" as well as in the collections at Tashkent and Gatersleben. Some taxonomic conclusions formerly solely drawn from dry specimens need to be revised. This is especially important because herbarium specimens of subg. *Melanocrommyum* display only a restricted amount of characters.

Now approximately 70 *Melanocrommyum* species are known from the former Soviet territories of Central Asia. They display a remarkable polymorphism and can be divided into groups on sectional and subsectional rank. Formerly only 8 sections and subsections were recognised by KAMELIN (1973), and 10 sections by FRITSCH (1992) resp. for those Central Asian species we regard to belong to subg. *Melanocrommyum*. Sections like *Melanocrommyum* (in the sense of KAMELIN 1973) and *Acmopetala* (in the sense of FRITSCH 1992) contained much more species than other sections and were inhomogenous. We propose more groups which shall also be formally recognised now.

2 Results

2.1 New and amended sections

Sect. *Acaule* R. M. FRITSCH, sect. nov.

Scapus brevis, pars supraterranea 1-3 cm longa. Folia 1-2, lamina 4-8 mm lata, 10-15 cm longa, glauca, lineari-lanceolata, margine denseque minute dentata. Inflorescentia fasciculata, usque 4 cm diametro. Pedicelli tepalis plus minus aequilongi. Filamenta tepalis 1/4 breviora, basi breve triangulato-dilatata, connata. Tepala lingulata, 5-7 mm longa, dilute lilacina, nervus purpureus. Ovarium depresso-globosum trilobatum, apice 6-cornutum.

T y p u s : *Allium hexaceras* VVED.

Allium hexaceras is a peculiar plant not much resembling any other species of subg. *Melanocrommyum*. A short scape and leaves more than 3 times as long as the supraterraneous part of the scape as well as pale lilac flowers similar to that of *A. akaka* GMEL. indicate some relations to species of sect. *Acanthoprason* WDB. However, the tepals of *A. hexaceras* remain soft and become wrinkled after flowering time instead of stiff and stinging, and are only 1/4 longer than the filaments. Horn-like outgrowths on the ovary are otherwise only known from the high-growing species *A. sarawschanicum* REGEL of sect. *Megaloprason* WDB. and *A. olivieri* BOISS. of sect. *Melanocrommyum* WEBB & BERTH. both of which cannot be nearly related. The minute species of sect. *Brevicaule* (see below) have much narrower tepals and shorter leaves, and another kind of flower colouration. *Allium hexaceras* occupies an isolated systematic position among Central Asian *Allium* species and should best be treated as a representative of a monotypic section.

Sect. *Aroidea* KHASSANOV et R. M. FRITSCH, sect. nov.

Rostrum spathae praecipue juvenaliter herbaceum non membranaceum. Perigonii stellati phylla oblonga concava, post anthesin reflexa et contorta. Filamenta perigonii breviora, basi anulata.

T y p u s : *Allium aroides* VVED. et M. POP.

The only species of this section *Allium aroides* (fig. 1) resembles *A. cucullatum* WDB. of sect. *Thaumasoprason* WDB. only superficially by a similar colour of tepals. The inflorescence of *A. aroides* is laxer and only half-globose shaped, the tepals are much smaller, and the leaves narrower and longer. The spathe possesses a more leaf-like structure and remains green and thick up to the time when it opens laterally and the

flower buds become exhausted on prolonged pedicells. The seeds are comma-shaped and of partly brownish, partly cream colour. The testa shows a unique, rather simple form of anticlinal cell walls without wart-like outgrowths (KRUSE, 1994).

Allium aroides is restricted to a rather small area in western Hissar and western Zeravshan mountain ridges. It shares with *A. verticillatum* REGEL the conical scape, a similar form of flowers, and also the form of testa cells is similar (KRUSE, 1994). It should be nearest related to section *Verticillata* R. KAM. and not to sect. *Thaumasoprason*.

Allium aroides as well as *A. gypsaceum* M. POP. and *A. verticillatum* are flowering rather late in June and July. These three species might represent rather ancestral forms having still not developed the strong ephemeroid character so typical for nearly all other species of subg. *Melanocrommyum*.

Sect. *Popovia* KHASANOV et R. M. FRITSCH, sect. nov.

Scapus 10-20 cm altus. Inflorescentia densaque subglobosa. Perigonii anguste campanulati phylla ex basi in partis quartis connata, exteriora oblonge-linearia, acutiuscula, interiora oblanceolata margine tenuiter undulato-denticulata. Filamenta perigonii phyllis duplo breviora.

T y p u s : *Allium gypsaceum* M. POP. et VVED.

The only species of this monotypic section (fig. 2) cannot be included into sect. *Thaumasoprason* because of its campanulate flowers with basally connate tepals. Otherwise this form of flowers is only known from taxa of sect. *Regeloprason* WDB., which represent the next relatives of *Allium gypsaceum*, and by the species of sect. *Vvedenskya* R. KAM. of subg. *Allium*. However, the flower stalks drop down from the receptacle when the seeds are ripe. This character is also met with in sect. *Thaumasoprason* and it could have been the reason to include the species there as it was done by KAMELIN (1973). A certain similarity to species of sect. *Melanocrommyum*, where *A. gypsaceum* was included by FRITSCH (1992), is only superficial.

Sect. *Brevicaule* R. M. FRITSCH, sect. nov.

Bulbus ovatus, usque 1.2 cm diametro, tunicis membranaceis. Scapus angustus, usque 15(20) cm longus, dimidia pars basalis subterranea, in vivo teres. Folia 1-2, lamina plus minus lineari-lanceolata, quam scapus valde longiora, viridia. Inflorescentia semiglobosa, multiflora. Tepala usque 6 mm longa, plus minus lineari-oblonga, quam filamenta longiora. Ovarium subsessile. Capsula ovato-triangularis, apice triplo emarginata, usque 5 mm longa.

T y p u s : *Allium sergii* VVED. (fig. 3)

Allium pauli VVED. (incl. *A. badakhshanicum* WDB.) and *A. eugenii* VVED. also belong to this section. It is a group of minute species adapted to a short vegetation period under an arid climate. There are no clear relations to any other section of the subgenus. Formerly assumed similarities to *Allium karataviense*, beside of which the species were classified by FRITSCH (1992), turned out to be restricted to the shape of inflorescences and the low scape.

We do not merge *A. pauli* with *A. chitralicum* WANG et TANG as proposed by SEISUMS (1992) because the latter species has up to six leaves, a scape up to 23 cm long, and pinkish tepals which are recurved and tortuous after flowering. Most probably *Allium chitralicum* belongs to sect. *Megaloprason*.

Allium karataviense (fig. 4) should be separated in a section of its own. There is a remarkable morphological variation concerning length and brittleness of scape, number of leaves (one to four in flowering stage), and of length (6-10 mm) and colour (whitish, pinkish tinged or a soft red) of tepals presented by plants of different offspring. Most characteristic is the deeply incised tip of the capsules which is not met with once more in subg. *Melanocrommyum*. The description of sect. *Miniprason* will therefore be amended:

Sectio *Miniprason* R. M. FRITSCH, emend. R. M. FRITSCH

Bulbus applanato-globosus, usque 6 cm diametro. Scapus validusque strictus aliquantum flexuosus, in vivo levis, in statu florendi saepe non supra 20 cm longus. Folia 1-3(4), lamina oblonga, plana, initio sulcata et intense glauca, margine rubra, levia. Inflorescentia initio semiglobosa, deinde globosa, multiflora, compacta. Tepala anguste linearia, obtusiuscula, margine et apice inflexa, serius recurvataque plus minus flexuosa, depravata. Filamenta tepalis aequilonga, inferne brevi-triangulari dilatata, supra subulata. Ovarium stipitatum, late globosum, triangulum, verruculosum. Capsula ovato-tri pyramidata, apice dimidio tripartita, usque 12 mm longa.

T y p u s : *Allium karataviense* REGEL

Allium karataviense is well adapted to stony slopes, rocky terraces and rock areas by its stocky habit (fig. 4). Its area of distribution reaches from the Karatau mountain ridge to the Darwaz mountain ridge.

2.2 New taxa of sect. *Acmopetala* R. M. FRITSCH

The species of this section are only distantly related to other tall growing taxa of the sections *Megaloprason*, *Compactoprason*, and *Melanocrommyum* despite of a similar habit. It is a heterogeneous group in regard to the shape of leaves and the characters of several flower parts. However, many species are rather similar among one another and can well be grouped together into subsections.

Subsectio *Acmopetala* R. M. FRITSCH, subsect. nov.

Scapus erectus, altus, in vivo laevis. Folia 2-5, lamina oblonga vel lineari-oblonga, oblique ascendens, recurvata, late canaliculata. Inflorescentia pluriflora, densa, initio fasciculata, mox globosa vel ovata basi paene complanata. Tepala anguste et longe triangulata, subplana, post anthesin irregulariter contorta, nervus terminatus sub apicem. Filamenta basi dilatata et connata, supra subulata. Ovarium stipitatum, trilobatum, depresso-globosum, verruculosum.

T y p u s : *Allium backhousianum* REGEL

The first subsection encloses *Allium backhousianum* REGEL (fig. 5, still better known under the synonym *A. gulczense* B. FEDT.) the type species of sect. *Acmopetala*. It is a remarkable species and could only be somewhat more related to *A. calocephalum* WDB. Both species are characterised by extremely long-triangular, whitish tepals, dilatated and long connected filament bases, and broad leaves. Also rather long and tapering, but pinkish and linear-lanceolate tepals as well as shortly connected filament bases are mentioned for *A. dasyphyllum* VVED., *A. alaicum* VVED., and the new species *A. zergericum* (fig. 7) described later on. These three species show much narrower leaf blades; they are rare and otherwise still insufficiently known. Probably best they should also be included here because they are still less similar to the species of the subsections *Longibidentata* and *Durovaginata* described below which are the nearest relatives of subsect. *Acmopetala*.

***Allium zergericum* F. KHASANOV et R. M. FRITSCH, sp. nov.**

Planta perenne. Bulbus applanato-globosus, 1.5-3 cm diametro. Scapus strictus cylindricus, levis, basi 8 mm et apice 5 mm diametro, ad 100 cm longus, glauco-viridis. Folia 1-3, glauca, declinata, lineari-lanceolata, crassiuscula, canaliculata, utrinque lato-costata, breviter apiculata, apice cochleato-cucullata, margine basi ciliata, superne scabra, 20-65 cm longa, 2-4 cm lata. Spatha membranacea, in valvas duas vel trias divisa. Inflorescentia usque 9 cm diametro, usque 7 cm longa, initio fasciculata, deinde subglobosa, multiflora. Pedicelli usque 5 cm longi. Flores stellato-cyathiformes. Tepala anguste lineari-triangularia, declinata, canaliculata, apice inflexa, obtusiuscula, 8-9 mm longa, 1-1,3 mm lata, pallide sordide-violascens, nervus angustus, rubido-brunneus. Filamenta libera, tepalis aequilonga, deinde 1/4 longiora, interiora basi quadrato-dilatata vel breviter dentata, exteriora latiora superne subulata, rosea, supra alba. Antherae 1,5-2 mm longae, 0,8 mm latae, initio purpureo-violaceae, deinde flavo-griseae. Ovarium globosum, deinde pyriforme, trilobatum, manifeste stipitatum, verruculosum, brunneo-viride, opacum. Stylus conico-filiformis, 3-7 mm longus, basi roseus supra albescens. Stigma integrum, albescens. Capsula conico-triangulata, usque 10 mm diametro, usque 8 mm longa, verruculosa, opaca.

Approxima *A. alaicum*, sed tepala longiora, folia glabra, filamenta basi quadrato-dilatata.

T y p u s : Ex horto instituti botanici Tashkent, leg. 19. majo 1992. Bulbis ex regione fluvii Zerger (dexter influxio Iassy, montes Ferganenses) misit anno 1990. TASH, isotypus GAT.

Known only from the typus locality.

Another couple of white flowering species has linear-lanceolate leaf blades, lanceolate, concave tepals, and extremely broad bases of inner filaments without teeth. They form the second subsection.

Subsectio *Albidiflora* R. M. FRITSCH, subsect. nov.

Scapus strictus, teres, levis, usque 60 cm longus. Folia stricta, lamina lineari-lanceolata, basi canaliculata, apice longe attenuata. Inflorescentia applanato-globosa vel semiglobosa, densa, multiflora. Tepala plus minus longe obovata, concava, apice unguiculata, albida, nervus viridis vel viride-badius, latus, in basi attenuatus. Filamenta subulata, basi breve connata, interiora basi valde dilatata, alba.

T y p u s : *Allium saposhnikovii* E. NIKIT.

Beside the type species, only the very nearly related (if not conspecific) *A. collis-magni* R. KAM. (fig. 6) belongs to this subsection. The mentioned taxa grow on somewhat humid northern slopes among shrubs and high perennials in the Karatau and Kirgizian Alatau mountain ridges. They are nearest related to the species of the next subsection from dry habitats sharing with them the medium height of scape and a similar form of leaves but differing by laxer inflorescences and purple filaments with toothed bases.

Subsectio *Inornatae* R. M. FRITSCH, subsect. nov.

Scapus strictus, teres, levis, usque 60 cm longus. Folia stricta, linearo-lanceolata, basi canaliculata, apice longe attenuata. Inflorescentia applanato-globosa vel semiglobosa, laxiuscula, multiflora. Tepala plus minus longe obovata, concava, apice unguiculata, rosea vel pallide viride-ochracea, nervus viridis vel viride-badius, latus, in basi attenuatus. Filamenta subulata, basi breve connata, interiora basi valde dilatata et bidentata usque quadridentatula, kermesina.

T y p u s : *Allium sewerzowii* REGEL s. str.

Two species belong to this subsection, *A. sewerzowii* REGEL s. str. (fig. 8) and the new species *A. tashkenticum* (fig. 10) described below. Both are rather inconspicuous plants generally not noticed neither by plant height nor by striking colours. A third taxon differing from *A. sewerzowii* s. str. by narrower leaves, longer pedicells, and

darker filaments has been collected on hills north of Khudzhand. It could be a new subspecies.

***Allium tashkenticum* KHASSANOV et R. M. FRITSCH, sp. nov.**

Allium collis-magni sensu LEVICHEV in KRASSOVSKAJA et LEVICHEV, Flora Chatk. Zapov.: 111 (1986), non R. KAM. (1976).

Bulbus ovoideus usque applanato-globosus, 10-15 mm longus, 15-20 mm diametro, tunicae papyraceae usque subcoriaceae, exteriorae subfragiles, griseo-brunnescentes, interiorae pallidae. Scapus strictus, 30-50(80) cm longus, 5-10 mm diametro, cylindricus vel supra tenuiter subsulcatus, viridis vel subglaucus. Folia 2-3(4), lamina lineari-lanceolata usque oblonga, recurvata, basi crassa subcanaliculata, superne plana, supra plus minus levis, inferne initio subcostata deinde levia, apice apiculata, cucullata, tenuiter albomarginata, margine basi tenuiter dentata apice sublevis, 20-30 cm longa, 20-35(45) lata, flavo-virida, nitidula. Spatha papyracea, in valvas duas vel trias ovatas acutas divisa, pallide-brunnea. Inflorescentia initio semiglobosa mox subglobosa, densa, multiflora, 4-6 cm longa, 5-8 cm diametro, post anthesin irregulare subfasciculata. Pedicelli subinaequilongi, stricti, viridi-brunnescentes, nitiduli. Flores stellato-cyathiformes. Tepala obovato-lanceolata, adscendens, superne subplicata, apice obtusa subinflexa, concava, 4-6 mm longa, 1.5-2 mm lata, post anthesin reflexa et subspiraliter contorta, pallide viride-ochracea, nervus latus in basi minor, virescens in sicco violascens. Filamenta tepalis aequilonga, subulata, basi breve connata interiora semiorbiculata dilatata, kermesina basi albescentia, in statu sicco intensiore colorata. Antherae elongatae, flavo-violaceae. Ovarium breve stipitatum, complanato-globosum trisulcatum, tenuiter tuberculatum, 2-2.5 mm longum, 3 mm diametro, viride, initio violaceo subcoloratum. Stylus conico-filiformis, pallide flavo-violascens, stigma integrum. Capsula breve obovato-triangulari, 5-7 mm longa, 3-4 mm lata, tenuissime scabra.

T y p u s : Ex cultis in horto Gaterslebensis No. TAX 2984, leg. 09. VI. 1992 [Bulbs collected in Uzbekistan: Karshantau-Gebirge, Tal Aktash ca. 10 km nördl. Gazalkent, steinige Südhänge bei 1650-1850 m NN, 03. VI. 1990 leg. R. FRITSCH und K. PISTRICK No. U591]

Habitat in montes Alatau Tashkentis, in rupestribus, clivis et in cacuminis montium aridorum regionis montani.

Affine *Allium sewerzowii* REGEL s. str. sed folia latiora flavo-viridia nitidula, inflorescentia compacta multiflora, tepala pallida, filamenta kermesina.

Other specimens seen: Tchimgan valley east of Tashkent: TAX 2516, HFAM No. 342: Popov & Vved. 30.VI.1926 (TASH 38509), Vasil'ev 15.VII.1920 (TASH 4153); Karshantau mountains north of Gazalkent: TAX 2524; Karagachli-sai, Bash-Kyzyl-sai and Sangardak between Tashkent and Angren: TAX 3351, TAX 3354, Lopot s.n. 10.VI.1966 (TASH), Levichev s.n. 03. VI. 1976 (TASH).

This new species is similar to *A. sewerzowii* REGEL s. str. by tepals with broad green nerves and intensively coloured filaments. However, its leaf blades are broader, nearly flat, yellow-green, and glossy, the inflorescence is compact because of shorter pedicells and a greater number of flowers, the tepals are somewhat narrower, of pale yellowish-green colour only somewhat reddish along the margin, and the filaments are carmine. The plants are the latest in flower among the species discussed above. Similar yellow-green, glossy leaves are also present in *A. rosenbachianum* s. str. However, all other characters exclude any near relationship between these two taxa.

Hitherto the name *Allium sewerzowii* was used for two different taxa. The first description was based on plants collected by SEWERZOW in the Boroldaj part of the Karatau mountain ridge (REGEL, 1868). One herbarium specimen still exists which has been selected as lectotype (FRITSCH 1990). However, already in 1887 REGEL erroneously determined plants from the vicinity of Tashkent as *Allium sewerzowii* which in fact belong to *A. suworowii* REGEL (still present in TASH, we agree to this correction by VVEDENSKY). This might have been the initial reason to apply permanently the name *A. sewerzowii* ("*A. severtzovii*" of VVEDENSKY 1924, 1935, 1971) to a slender taxon from the mountains around Tashkent having a somewhat flexuosus scape, a rather dense inflorescence (fig. 9), bright pink flowers with linear-lanceolate tepals recurvated and enrolled after flowering, and narrow nerves. Such plants grow on humid, somewhat shaded slopes. We looked for them in the Boroldaj mountains, but were not able to find them there, nor to trace any specimen of them from Karatau area in the herbaria of Alma-Ata and Tashkent. More humid slopes of Karatau ridge (including Boroldaj part) are solely occupied by the pure white flowering *Allium collis-magni* (see above), whereas on dry steppe slopes of lower elevations only one pinkish flowering taxon could be found which well corresponds to the lectotype and first description of *A. sewerzowii*. This taxon must have been ment by REGEL when describing *A. sewerzowii* and, according to the International Code, it must bear this name. Its distribution reaches the steppes north of Tashkent and the adyrs (hilly pre-mountains) nearby. Its amended description is given now:

Allium sewerzowii REGEL, Suppl. Indic. sem. a. 1866 horti Petrop. (1867) 26, sensu stricto, emend. R. M. FRITSCH, non *Allium severtzovii* sensu VVED., Consp. Florae Asiae Mediae 2: 84 (1971), et auct.

Planta perenne. Scapus strictus, cylindricus, 4-8 mm diametro, apice sublatis, 40-60 cm longus, in vivo levissimus, viridis, basi rubescens, opacus. Folia 1-2, lamina lineare-lanceolata, stricta, late canaliculata, sensim cuspidata, 10-25 mm lata, 20-50 cm longa, supra subsulcata, inferne fere tenuiterque lato paucicostata, tenuissima albomarginata, margine denticulata, glauca, opaca. Spatha membranacea, in valvas duas vel trias longe cuspidata divisa, albida. Inflorescentia semiglobosa, mox planiusculo-conica, multiflora, laxiuscula. Flores stellato-cyathiformes. Tepala lineari-obovata vel oblonga, concava, initio curvato-patentia, mox deflexaque contorta, 5.5-7 mm longa, circa 2 mm lata, rosea, nervus latissime viride-badius. Filamenta subulata, interiora basi

membranaceo-dilatata, subconnataque longe bidentata, purpurea vel violacea, basi et apice albescens. Antherae oblongae, lutescento-roseae. Ovarium stipitatum, depresso-globosum, trisulcatum, tenuis tuberculatum, glaucum. Stylus tenuiter conicus, purpurascens. Stigma integrum, albescens.

Lectotypus: Im Kokanischen [Karatau] bei Boroldai leg. Sewerzow Mai (det. Fritsch, 1990) LE

Habitat in Tian-Shan occidentali, in rupestribus et clivis aridorum stepparum regionis collini.

Other specimens seen: Kurami mountains north of Khudzhand: TAX 2949, TAX 2951, Vernik, Nabiev & Zukervanik No. 153 28. V. 1953 (TASH); Steppe between Dzhilga and Tashkent: TAX 3358, TAX 3370, Levichev s.n. 28. V. 1987 (TASH); Karatau mountains, Kujuk pass: TAX 3690, Boroldaj chain: TAX 3686, TAX 3687; Talassian Alatau: Mokeeva & Linczevskij No. 26, 19. V. 1927, and No. 74, 23. V. 1927 (TASH),

The plants from the Tashkent Alatau area are well separated by the above mentioned morphological characters as well as by an own area of distribution. We regard them as an own species. It must be newly described because an older name is not available. A name similar to the traditionally used orthographic variant "*A. severtzovii*" seems to be most appropriate. This taxon will be newly described as *Allium severtzovioides*; it belongs to the next new subsection.

Subsectio *Durovaginata* R. M. FRITSCH, subsect. nov.

Scapus validus, strictus aliquantulum flexuosus, teres, in vivo levissimus, usque 80 (100) cm longus. Folia 2-3(5), lamina lineari-lanceolata, stricta, subrecurvata, breviusculata, margine plus minus scabra, 20-50 cm longa, usque 3,5(5) cm lata. Folium vaginans manifeste supraterraneum, elongatum, durum, scabrum vel costatum, longe perdurans. Inflorescentia initio semiglobosa deinde subglobosa, pedicelli sursum curvati. Tepala longe lanceolato-triangulara, apice saepe plicata, rosea, nervus angustus. Filamenta tepalis aequilonga, subulata, interiori basi dilatata subconnata, rare bidentata, pallide rosea. Ovarium substipitatum, depresso-ovatum tricrenatum, tenuiter tuberculatum.

Typus: *Allium costatovaginatum* R. KAM. et LEVICHEV

Also *A. rudolfii* TURAK., *A. motor* R. KAM. et LEVICHEV (including *A. tokaliense* R. KAM. et LEVICHEV), and the above already discussed *A. severtzovioides* (fig. 9) belong to this group of nearly related taxa. Their area of distribution is restricted to the western Tian-Shan (Chatkal and neighbouring mountain chains). They show an easily recognisable character: the outermost sheath leaf prolongs above the soil surface into an up to 12 cm long, hard tube which remains visible at least up to the flowering stage. The plants are taller than those of subsect. *Inornatae*; their tepals are more or less long triangular with a narrow nerve.

***Allium severtzovioides* R. M. FRITSCH, sp. nov.**

A. severtzovii sensu VVED., Flora URSS 4: 266 (1935), Consp. Florae Asiae Mediae 2: 84 (1971), non *A. sewerzowii* REGEL (1867).

Planta perenne. Bulbus subglobosus, 1-2(4) cm diametro, tunicis membranaceis, dureis, fere longitudini-fissuratis. Scapus erectus, subflexuosus, in vivo teres. Folia 2-3(5); lamina lineari-lanceolata, stricta, basi canaliculata, crassiuscula, apice tenuicula, cucullata, subspirale, demum dependens; supra subsulcata, inferne fere tenuiterque lato leviter costata, 20-40(50) cm longa, 10-35(50) mm lata, albomarginata, margine denticulata superne glabrescens; glaucissima. Spatha membranacea, in valvas duas vel trias late ovatas divisa. Inflorescentia initio semiglobosa, mox globosa, densa, multiflora, usque 5 cm diametro. Pedicelli tenui, stricti, nitidi. Flores stellatae. Tepala lineari-lanceolata, obtusiuscula, apice carinata, 5-7 mm longa, circa 1,5 mm lata, post anthesin decurvata et spiraliter contorta, lucide-rosea, nervus angustus, purpureus, inferne viridis. Filamenta tepalis subaequilonga, subulata, in basi triangulare dilatata, breve connata, saepe bidentata, roseo-purpurea. Antherae longiusculae, luteo-violaceae. Ovarium breve stipitatum, depresso-globosum, trisulcatum, tenuis tuberculatum. Stylus tenuiter conicus, albus, deinde violascens. Stigma integrum.

T y p u s : Uzbekistan: Westl. Ausläufer des Tian-Shan, Gebirgskette Karshantau ca. 50 km nordöstl. von Tashkent, Tal oberhalb von Aktash (Sajlyk), Westhang mit *Juglans regia*, ca. 1450 m NN. (GAT, isotypi TASH, GAT, living isotypic collection TAX 2983)

Habitat in montes Alatauicis Tashkenticis, in rupestribus et clivis humidis regionis montanae.

Affine *A. sewerzowii* REGEL s. str. sed scapus longiore, subflexuosus; inflorescentia densaque mox globosa, flores vivide-rosea, nervus angustus, et filamenta dilutus.

Other specimens seen: Bot. Garden Tashkent: TAX 1137; Karshantau northeast of Tashkent: TAX 2521, TAX 2522, TAX 2985; Kurami mountains north of Khudzhand: TAX 2955, TAX 2956, Fritsch & Pistrick No. 528/90 (GAT);

Another group of pinkish-flowering species is characterised by a smaller and still slender stature and still more elongated tepals. The bases of their filaments are broadened, long connected, and show mostly long tooth-like appendages on the inner filaments.

Subsectio *Longibidentata* R. M. FRITSCH, subsect. nov.

Scapus strictus, teres, in vivo levissimus, usque 60(80) cm longus. Folia 2-3(5), lamina lineari-lanceolata, recurvata, canaliculata, 15-30(50) cm longa, usque 2(3) cm lata, viridia. Inflorescentia applanato-globosa, densa, multiflora, pedicelli sursum curvati. Tepala longe triangulata, apice subplicata, rosea usque lilacina, post anthesin recurvataque immutata vel plus minus spiraliter contorta, nervus angustus, minus manifestus

apice plus minus invisibilis. Filamenta tepalis subbreviora, subulata, basi breve connata, interiora basi valde dilatataque bidentata vel multidentatula. Ovarium substipitatum, pyriforme-triangularum, tenuissime tuberculatum.

T y p u s : *Allium fetisowii* REGEL

In this subsection rare as well as insufficiently known species are grouped together with the type species which is broadly distributed in the Zaili-Alatau mountain ridge. *Allium pangasicum* TURAK., very similar to *A. fetisowii*, has a small area of distribution at the Kurami mountains in the west, whereas the nearly related *A. dodecadontum* VVED. is only known from a small area in the east of the Chatkal ridge but might be more widely distributed. *Allium simile* REGEL, still insufficiently known, is distributed at the Kirgizian Alatau mountain ridge; it has to be cleared up whether it is more than a western variant of *A. fetisowii*. The fifth species *A. schachimardanicum* VVED. is somewhat exceptional because it has only been found on its "locus classicus" nearby Shakhimardan at the northern Alai mountain range. It differs also by the lack of lateral teeth on the filament bases. Otherwise this species is more similar to the *A. fetisowii* alliance than to species of any other subsection.

Subsectio *Spiralitunicata* R. M. FRITSCH, subsect. nov.

Tunicae bulbi chartaceo-coriaceae, validae, longitudiner fissae, apice longe attenuataeque subspiraliter contortae, persistens. Scapus strictus, teres, in vivo levissimus. Folia (2)3-6, lamina lineari-lanceolata, stricta subrecurvata, canaliculata. Inflorescentia initio subfasciculata deinde applanato-globosa, densa, multiflora. Tepala stricta, ovata vel late lanceolata, concava, obtusiuscula, rosea vel lilacina usque rubra, post anthesin recurvataque contorta, nervus saturate coloratus vel viride-brunnescens. Filamenta subulata, tepalis sublongiora vel subbreviora, basi dilatataque breve connata. Ovarium brevissime stipitatum, depresso-globosum sexangulatum, levis vel tenuiter tuberculatum.

T y p u s : *Allium suworowii* REGEL

Exceptional firm and longlasting bulb tunics elongated into spirally twisted appendages along the bulb neck as well as rather many leaves are the common characters of the four species included here. The type species, easily recognised by the completely smooth and glossy ovaries (fig. 12), is a rather tall plant of up to 1 m height whereas *A. fibriferum* WDB. from southeastern Afghanistan, *A. insufficiens* VVED. from southern Tadzhikistan and northern Afghanistan, and the rare *A. vvedenskyanum* PAVL. from the Chu-Ili-Mountains exceed rarely 40 cm height, have very narrow leaves and have coarse ovaries. This subsection is somewhat more inhomogenous than most other subsections.

Subsect. *Stellata* KHASANOV et R. M. FRITSCH, subsect. nov.

Inflorescentia initio hemispherica, deinde globosa, laxiuscula. Perigonii stellati phylla linearia (marginibus subparallelibus), obtusa, post anthesin reflexa, contorta. Filamenta basi manifeste anulata.

T y p u s : *Allium taeniopetalum* M. POP. et VVED. (fig. 11)

This section comprises also *Allium mogoltavicum* VVED. and a still undescribed taxon from the Turkestan mountain range. These species are distributed in small areas along the 40th latitude from Navoi in the west to Khudzhand in the east. Only a local form of *A. mogoltavicum* (*A. baschkzyzlsaicum* KRASS.) occupies an own and very small area of distribution on the western slopes of the Chatkal mountain ridge.

A globose inflorescence and nearly linear tepals are rather uncommon characters in sect. *Acmopetala* and would better fit to sect. *Megaloprason*. However, the seeds of the species of subsect. *Stellata* are rather flat and sharply angled, and their ovary is finely tuberculate, as it is typical for sect. *Acmopetala*. Without doubt subsect. *Stellata* stands more closely to sect. *Megaloprason* than to other subsections of sect. *Acmopetala*.

2.3 New taxa of sect. *Compactoprason* R. M. FRITSCH

Allium komarowii LIPSKY was a species of somewhat unclear taxonomic position. After having been able to study living plants we concluded, that it has its nearest relatives among the species of sect. *Compactoprason*. Its inclusion into that section makes it necessary somehow to emend the descriptions of the section and of the typical subsection.

Sectio *Compactoprason* R. M. FRITSCH, emend. R. M. FRITSCH

Scapus strictus, in vivo levissimus, ad 150 cm longius, 2 cm diametro. Folia 5-7, lamina late-lanceolata vel oblonga, reflexa saepe cacumen involvens, margine glabra, usque 60 cm longa, 15 cm lata. Inflorescentia ab initio globosa, compactissima, pluriflora, in statu maturitatis plus minus dilapsis. Pedicelli angustissimi, tanto serotiflori quanto longiori. Tepala oblonga usque lanceolata, nunc sensim nunc brevis cuspidata, patentia, cochlearia, post anthesin plus minus immutata vel spiraliter retorta. Filamenta plerumque manifeste tepalorum longioribus, inferne triangulato-dilatata, supra subulata. Ovarium initio brevistipitatum, late trilobatum, verruculosum. Capsula late trilobata, ovata vel obovata. Semina ovata usque guttiforme, dense reticulata rugati-costata.

T y p u s : *Allium giganteum* REGEL (fig. 18)

Subsectio *Erectopetala* KHAASSANOV, emend. KHAASSANOV

Tepala post anthesin immutata, erecta. Capsula in maturitate angusti-aperturata et saepe basi defrangerentia. Semen plerumque unum in loculis, saepe unum in ovario.

T y p u s : *Allium giganteum* REGEL

Subsect. *Komaroviana* KHAASSANOV et R. M. FRITSCH, subsect. nov.

Folia late ligulato-obovata, obtusa, glauco-viridis subviolacens, rude valleculata. Inflorescentia semiglobosa, pluriflora, densa. Perigonii substellati phylla lanceolata, obtusiuscula, post anthesin deflexa et irregulariter contorta.

T y p u s : *Allium komarowii* LIPSKY

The only species *Allium komarowii* is smaller than the other taxa of sect. *Compactoprason* and differs additionally by lengthwise furrowed, violetish-green leaves, only subglobose and less dense inflorescences, and long-ovate capsules which do not drop from the pedicells nor do the pedicells drop from the receptacle. These differences underline a separated position of *A. komarowii* in sect. *Compactoprason*. However, still much more differences exist against the species of other sections of subg. *Melanocrommyum*.

Subsect. *Spiralopetala* KHAASSANOV et R. M. FRITSCH, subsect. nov.

Inflorescentia globosa, pluriflora densissima. Perigonii stellati phylla elliptica, obtusa, post anthesin reflexa et spiraliter contorta.

T y p u s : *Allium majus* VVED. (fig. 17)

The only species included is similar to *Allium giganteum* sharing with it nearly all characters typical for sect. *Compactoprason*, especially that the capsules drop when the seeds are ripe. However, the capsules open rather widely in *A. majus* and contain commonly two seeds. Because its tepals are enrolling after flowering (fig. 17), it cannot be included into subsect. *Erectopetala*.

Some characters of sect. *Compactoprason* are also found in sect. *Thaumasoprason*, especially the very dense and later fragile umbel, very thin pedicells, and the erect tepals maintaining their form in the fruiting stage. Despite the great difference in plant shape, we conclude sect. *Thaumasoprason* to be most (although distantly) related to sect. *Compactoprason* and not to sections *Kaloprason* and *Regeloprason* where it was placed by WENDELBO (1971).

2.4 A new subsection and a new combination of sect. *Kaloprason* C. KOCH

Subsect. *Ligulifolia* R. M. FRITSCH, subsect. nov.

Scapus flexuosus, in vivo levis, conicus, quam folia brevior. Folia 1-3(4), lamina oblonga, plana, initio sulcata et intensive glauca, margine rubra, levis. Inflorescentia initio applanato-globosa deinde irregulariter globosa, laxa, multiflora. Tepala anguste triangulato-lanceolata, stricta, roseo-brunnescent, nervus viridis vel brunneo-purpureus, latus, post anthesin incrassatus vel immutatus. Filamenta tepalis breviora, subulata, basi dilatata. Ovarium substipitatum, breve pyriforme vel applanato-globosum, sexangulare.

T y p u s : *Allium alexeianum* REGEL

Only two nearly related vicariant species belong to this subsection: *A. alexeianum* and *A. nevskianum* VVED. ex WDB. distributed in the western Pamir-Alaj mountain systems. Both share long ovate, blue-green leaves having red margins with *A. karataviense* of sect. *Miniprason* and *A. komarowii* of sect. *Compactoprason*. However, the loose inflorescence composed of very unequal pedicells, the rather short and inverted conical scape, the broadly funnel-shaped flowers, and filaments much shorter than the straight tepals are unmistakable characters of sect. *Kaloprason*.

***Allium caspium* (PALLAS) M. BIEB. ssp. *baissunense* (LIPSKY) KHASSANOV et R.M. FRITSCH, comb. nov.**

Basonym: *Allium baissunense* LIPSKY, Acta Horti Petrop. 18: 140 (1901).

Allium caspium is widespread in the deserts from the Caspian Sea to lake Balkhash and to Pakistan. That's why it is not surprising that the species is very polymorphous, especially the form and the colour of the tepals are very variable. Plants from dry over-salted and gypsum slopes on the submontane level of southern Uzbekistan and southern Tadzhikistan are rather slender with only moderately unequal pedicells and white or slightly violet flushed flowers. This taxon is morphologically rather constant, ecologically well separated, and has an own area of distribution. Otherwise it does not differ from *A. caspium* and should best be regarded as a subspecies.

2.5 A new species and a new combination of sect. *Megaloprason* WDB.

Allium rosenbachianum REGEL is a name having been used by several authors in very different ways. The study of the type specimen as well as of living collections from the "locus classicus" led to the conclusion, that according to the Code this name must be used for a taxon clearly separable by a smooth scape, much broader and glossy leaf

blades, and silvery-pinkish flowers (FRITSCH 1993). In the sense of WENDELBO (1971), *A. rosenbachianum* was applied to Afghan taxa one of which has earlier been described by him as *A. angustitepalum* WDB., and, may be, still another taxon morphologically similar. Otherwise the name *A. rosenbachianum* was used by VVEDENSKY (1935, 1971) and in the European bulb trade for plants having a fully ribbed scape, nearly lorate, dull green leaves, and decorative, shining pink flowers (fig. 13). Such plants grow naturally in the Hissar mountain ridge of Tadzhikistan, especially on its southern slopes. In recent time some cultivars of *A. rosenbachianum* hort. were introduced into the bulb trade also originating from this region. It is not exactly known where the old stocks of the bulb trade came from, but it could well be that they go back to plants collected by Albert REGEL and received from the Imperial St. Petersburg Botanic Garden one century or more ago. It was implicated in an earlier paper that *A. rosenbachianum* sensu VVED. et hort. should be named *A. jesdianum* BOISS. et BUISE (FRITSCH 1990).

A recent visit to the Iran (FRITSCH in prep.) enabled the junior author to analyse living plants on the "locus classicus" of *Allium jesdianum* at Deh Ballo in the mountains near Yazd (fig. 14) as well as herbarium specimens at EVIN. This species turned out to have rather fine (not net-like), brittle bulb tunics, a scape distantly ribbed only in its lower part and smooth above, narrow lanceolate leaf blades, a rather loose, basally flattened and violet flushed inflorescence, and bright carmine flowers. The filament bases are only slightly broadened. This taxon is nearly related to WENDELBO'S *A. angustitepalum* but is not conspecific with *A. rosenbachianum* sensu VVED. et hort.

Therefore the latter taxon must bear another name. Because an elder name is not available, the taxon is newly described here. The epitheton is deduced from "*Allium rosenbachianum* auctorum" (fig. 11).

***Allium rosenorum* R. M. FRITSCH, sp. nov.**

A. rosenbachianum hort., *A. jesdianum* hort., *A. rosenbachianum* sensu VVED., Consp. Florae Asiae Mediae 2: 85 (1971), *A. jesdianum* sensu R. M. FRITSCH, Kulturpflanze 38: 363 ff., 1990.

Bulbus applanate-ovoideus, usque 3 cm diametro, plerumque longitudine divisus, tunis papyraceis nervosis, griseo-brunescens. Scapus 30-100 cm altus, diametro 3-10 mm, perfecteque dense costatus, opacus, viridis basi brunescens. Folia (3) 5-9(12), lamina sublinearia, recurvata, canaliculata, basi paulo contracta, crassiuscula, apice tenuiter saepe dependens, longe acuminata, supra levis, inferne latiore mucronata-costata, margine levis, 20-45(60) cm longa, 10-20(40) mm lata, glauca, opaca. Spatha membranacea, in valvas duas late ovatas longicuspidadas dilute-brunneas divisa. Inflorescentia subglobosa deinde globosa, densa, multiflora, diametro 60-12 cm. Pedicelli stricti, angusti, nitidi, plus minus viride-brunnei. Flores stellato-cyathiformes. Tepala longe triangulare-cuspidata, initio ascendens, deinde recurvata spirali-ter contorta, 7-10 mm longa, 1-1,5 mm lata, dilute rosea, nervus angustus, viride-

badius. Filamenta tepalis subaequilonga, subulata, basi breve triangulare-dilatata et connata, dilute-rosea. Antherae elongatae, initio roseo-violaceae, deinde luteae. Ovarium stipitatum, obconico-trisulcatum, valde tuberculatum, viride. Stylus conico-filiformis, albus, stigma indivisum. Capsula breve obconico-trisulcata, usque 6 mm longa, 8 mm diametro, scabra, opaca.

T y p u s : Tadzhikistan: Hissar-Gebirge, Ramit-Schutzgebiet, linkes Seitental des Kholmon-Flusses, am Bachlauf unter Gebüsch, ca. 1370 m ü.M., 14. Mai 1987, leg. R. Fritsch Nr. 155 (GAT, Isotypi: GAT, TAD, living isotypic strain TAX 2256)

Habitat in montes Hissar australi, in rupestribus et clivis humidioribus regionis montanae.

Approxima *A. jesdianum*, sed tunicae bulbi papyraceae, nervosae, folia sublineata, canaliculata, scapus distincteque dense costatus, inflorescentia densa, multiflora, flores dilute roseae.

Selected other specimens seen: Unknown garden origin: TAX 0653, TAX 3781, TAX 3783; valley of the river Kafinigan and its side valleys east of Dushanbe: TAX 0975, TAX 1869, TAX 2256, TAX 2529-2530; valley of the river Varzob and its side valleys north of Dushanbe: TAX 1317, TAX 1327, TAX 1328, TAX 1345, TAX 1880, TAX 1885-1887, TAX 1900-1903, TAX 2259, TAX 2266-2267, TAX 2270-2271, TAX 2552; Northern slope of Hissar mountain chain south of Pendzhikent: TAX 2566; Aktau mountain ridge northwest of Kurgan-Tjube: TAX 2938.

Allium rosenorum (fig. 13) is broadly distributed in Hissar mountains at elevations between 1200 m and 2500 m above sea level. A form of more delicate stature (up to 60 cm high) occupies shadowy places in forests, along streams and in riverlet gorges, and very often in the shadow of solitary large trees. At elevations above 1600 m a greater form (up to 100 cm high) can be met with on sunny but well watered loamy or stony slopes. Both forms remained stable under cultivation at Gatersleben.

***Allium jesdianum* BOISS. et BUISE ssp. *angustitepalum* (WDB.) KHASSANOV et R. M. FRITSCH, comb. nov.**

Basonym: *Allium angustitepalum* WDB., K. Danske Vid. Selsk., Biol. Skr. 10 (3): 169 (1958)

The general appearance of *A. jesdianum* from its classical place is similar to *A. angustitepalum* which is especially impressive by the initially striking white upper filament parts of both taxa. Because of having broadly canaliculate leaves, a broadly-ovate inflorescence with brownish, not purple, flushed pedicells, quadrate filament bases, and the great distance between the areas of distribution they should best be treated as subspecies. The typical subspecies is only known from the Yazd area, whereas subsp. *angustitepalum* grow in the mountains of northern Afghanistan and southern Uzbekistan (Kughitang ridge).

**Revised key for determination of living plants of
sect. *Megaloprason* in flowering stage**

1. Scape at least in its lower part lengthwise prominently ribbed (subsect. *Costatae* R. M. FRITSCH 2
- 1* Scape smooth 6
2. Scape narrowly ribbed, ribs in the upper part of the scape less remarkable, but present. Leaves 4-8(10), laminae narrow lanceolate, 10-35 mm broad, basal part distinctly canaliculate, upper part becomes quickly lax and hangs down, lower side broadly ribbed. Tepals arcuately reflexed. Filaments uniformly rose-lilac or basal part somewhat darker. *A. rosenorum* R. M. FRITSCH
- 2* Scape distantly ribbed, ribs in the upper part missing or extremely shallow. Rarely more than 4-6 leaves. 3
3. Plants stout. Laminae rather erect, 1/2-2/3 as long as scape. Inflorescence dense, half-globose, finally subglobose. Tepals 7-9 mm long, 2-2.5 mm broad. Filaments whitish-pinkish to purplish throughout. *A. hollandicum* R. M. FRITSCH
- 3* Plants slender. Laminae up to 12(16) mm broad and erect, or broader and arcuately reflexed, 2/3-3/4 as long as the scape. Inflorescence moderately dense, initially broader than long, later globose. Tepals 6-10 mm long, 0,7-2 mm broad, arcuately reflexed. Filaments basal pinkish, the subulate part white or pale pinkish. 4
4. Bulb tunics netted. Laminae more or less erect, narrow lanceolate, up to 12(16) mm broad. Pedicells upwards bent, thin. Tepals pale pink to whitish, long tapering, filament bases triangular, upper part whitish, later pale pink. *A. bakhtiaricum* REGEL
- 4* Bulb tunics not netted. Laminae arcuately reflexed, more than 12 mm broad. Pedicells stright, thick. Tepals bright carmine. Filaments striking white above 5
5. Laminae nearly flat. Pedicells throughout purple. Filament bases triangular *A. jesdianum* BOISS. et BUISE subsp. *jesdianum*
- 5* Laminae broadly canaliculate. Pedicells brownish. Filament bases quadrate. *A. jesdianum* subsp. *angustitepalum* (WDB.) KHASS. et R. M. FRITSCH
6. Leaves (3)4-8(19), laminae (20)30-80(120) broad, smooth, scabrid, or pubescent, basally only slightly tapering. Tepals brightly pinkish to purple (rarely white). Inflorescence rather dense (subsect. *Elatae* R. M. FRITSCH). 7
- 6* Leaves (1)2-4(6), laminae (10)15-50(65) broad, basally distinctly tapering. Inflorescence loose. Tepals inconspicuously silvery-pinkish (subsect. *Megaloprason* R. M. FRITSCH). 9

7. Plants flowering in May. Laminae rather broad, sideways bent, mostly \pm pubescent or scabrid along the margin (sometimes fully smooth). Inflorescence longer than broad or globose. Tepals 10-12 mm long, 1.3-1.8 mm broad. Dilatated bases of inner filaments 1.2 times as broad as those ones of the outer filaments
..... *A. stipitatum* REGEL s. str.
- 7* Plants flowering in June. Laminae stiff erect, completely glabrous. Tepals 6-7 or 8-9 mm long, 2-2.5 mm broad. Broadened bases of inner filaments 1.4-1.7 times as broad as those ones of the outer filaments. 8
8. Scape 80-120 cm high. Laminae up to 5 cm broad. Inflorescence contains not very much flowers, up to 9 cm in diameter. Tepals 6-7 mm long, (dark) purple.....
..... *A. altissimum* REGEL
- 8* Scape 120 to 180 cm high. Laminae up to 15 cm broad. Inflorescence contains very much flowers, up to 12 cm broad. Tepals 8-9 mm long, pink to faint purplish-violet.
..... *A. aflatunense* B. FEDT. s. str.
9. Lamina longitudinally plissé, the outer leaf long-ovate, up to 10 cm broad, of the inner leaves much narrower, margins basally overlapping and collar-like outside bent. Upper part of the ovary with oblique-upwards directed and radially elongated outgrowths. *A. sarawschanicum* REGEL
- 9*. Laminae yellowish green, not longitudinally plissé, gradually tapering towards a petiole-like basis, the outer leaf up to 6 cm broad, the inner leaves slightly narrower. Ovary without elongated outgrowths. 10
10. Scape 40-50 cm high. Laminae \pm adpressed to the earth, tapering towards a narrow base. *A. rosenbachianum* REGEL s. str.
- 10* Scape 60-80 cm high. Laminae strictly erect, basally slightly tapering.
..... *A. rosenbachianum* subsp. *kwakense* R. M. FRITSCH

2.6 New subsections of sect. *Regeloprason* WDB.

This section is well characterised by fasciculate inflorescences, by the narrow perigonium (not in every case campanulate), and by short filaments the bases of which are triangular-broadened and at least half of their length united with the tepals. The two subsections are differing by the form of inflorescences in the fruiting stage.

Subsect. *Regeloprason* (WDB.) R. KAM. emend. R. M. FRITSCH

Flores minus odoratae. Inflorescentia initio anguste fasciculata, post anthesin laxissima, fasciculata vel ovata. Pedicelli valde inaequalongi, minimum capsulis triplo longiore.

T y p u s : *Allium regelii* TRAUTV.

The typical subsection is characterised by permanently elongating pedicells during bloom and afterwards for 3-10 times. Thus the inflorescences become very loose in the fruiting stage; they may be fasciculate and mostly composed of superposed parts in the case of the type species (including *A. yatei* AITCH. et BAKER), or simply fasciculate for the nearly related *A. iliense* REGEL, *A. cupuliferum* REGEL s.str., and the rare Iranian *A. cathodicarpum* WDB., or broadly ovate for *A. lipskyanum* VVED. and *A. victoris* VVED.

Subsect. *Odoratae* R. M. FRITSCH, subsect. nov.

Flores intense odoratae. Inflorescentia initio semiglobosa densissima post anthesin densiter fasciculata, pedicelli capsulis usque duplo longiore.

T y p u s : *Allium darwasicum* REGEL

The species of this subsection have a compact inflorescence in the fruiting stage because their pedicells elongate not more than twice during anthesis and afterwards. Name-giving is another somewhat surprising character: the flowers are intensively sweet-scenting somewhat like hyacinths, not faintly honey-like as most other *Allium* species. Also *A. hissaricum* VVED., the taxonomically still unclear *A. winklerianum* sensu VVED., and the only recently described *A. chodsha-bakirganicum* GAFF. et TURAK. belong to this subsection.

2.7 Remarks on lectotypifications

The type collection of *Allium brachyscapum* VVED. mentioned by VVEDENSKY (1934) consists of several sheets out of which No. 118720 (TASH) is selected herewith as lectotype.

A lectotype was chosen for *Allium alaicum* VVED. (FRITSCH 1990) because a sheet with the correct date of collection (01. VI. 1900) could not be traced at LE. Surprisingly this wanted sheet have been found in London (BM) where it was apparently received by exchange from LE long ago when type specimens were still not separated. As long as no second sheet of the same date is known the sheet at BM is the holotype. The cited lectotypification is superfluous.

The holotype of *Allium verticillatum* REGEL (Sarawschan-Tal, leg. O. Fedtschenko) was recently found in a separated collection at Tashkent left by Boris Fedtschenko which contains also other material collected by his mother OLGA. This makes the neotypification of this taxon (FRITSCH 1990) invalid.

A dried specimen of *Allium backhousianum* REGEL was traced by SEISUMS (information in letter) at LE. It becomes the holotype and makes the lectotypification (FRITSCH 1990) superfluous.

3 General discussion

The species of subg. *Melanocrommyum* are a complicated group because many characters like surface of scape, form and surface of leaf blades, shape, colour and texture of tepals change substantially when the plants are dried for the herbarium. Often not recognised is a second problem which depends on the good adaptation of the plants to arid conditions: because of very thick epidermal layers the plants dry very slowly in the press if not specially treated. Their buds can still develop into "open" flowers, or pollinated flowers into capsules, which, of course, leads to special artifacts. Unfortunately, the keys proposed by VVEDENSKY (1935, 1971) for determination of Central Asian species were solely based on dry specimens, and often he used unclear quantitative characters. So it's not surprising that his keys do not allow to determine many species in the living state as found in the nature. In a few cases key characters used by him turned out to be casual ones recognisable solely on those dry materials which he had seen.

Therefore we tried to compare as many taxa as possible as living plants as well as herbarium specimens. We recognised such characters as the surface of scape and leaf lamina, the general appearance of star-like flowers, the shape and texture of tepals after flowering stage, and the special form of broadened filament bases, as well as form and surface of ovary and capsule in the living state. Not all of these characters are traditionally highly valued for recognition of taxa. Otherwise we regard some of the "traditional" characters to be less important, like the presence or absence of side teeth on filament bases.

Many species of subg. *Melanocrommyum* cannot be exactly determined solely on herbarium specimens if no comprehensive description (or good photographs, etc., of flowers) accompanies the dry material. We will not say that the collection of completely determinable specimens of *Melanocrommyum* taxa is only a matter for specialists, but we underline that for a good *Allium* specimen more care during the process of preparation is necessary than most occasional plant collectors imagine.

Seventy percent of all Central Asian species are only known from the territory of the now independent republics which were formerly under Soviet government. Such a high percent of endemics of genus *Allium* has not been counted anywhere else. This statement remains also true if we consider that further botanical exploration in Afghanistan and parts of Pakistan, China, and the Iran, which are still insufficiently known to botanists, will diminish the number of endemics in the future. Many species, especially of sect. *Acmopetala*, are only known from small areas of distribution where they could have been evolved rather recently. Other species like *A. aroides* apparently occupy refugial areas. We regard Central Asia as an important evolutionary centre of subgenus *Melanocrommyum*.

4 Acknowledgments

We thank for the possibility to see many species under natural conditions during several expeditions in Central Asia supported by the Botanical Institutes at Dushanbe, Taskent, and Almaty. We are greatly indebted also to the curators and staff of herbaria at Dushanbe, Tashkent, St. Petersburg, Kew, London, Paris, Geneve, Vienna, Jena, Göttingen, Kassel, Munich, and Berlin, especially to Prof. Dr. I.O. Bajtulin (Almaty), T. Adylov (Tashkent), Dr. I. Turakulov (Khudzhand), Dr. I.G. Levichev (St. Petersburg), B. Mathew (Kew), Prof. Dr. H. Freitag (Kassel), Prof. Dr. D. Podlech (Munich), for working facilities and permanent support during the stays there. We thank the Deutsche Forschungsgemeinschaft for financial support (grants FR 1044/1-1, Usb 436). We also want to thank Dr. A. Seisums (Riga) for information given in letter, and Dr. J. Kruse (Gatersleben) for critically reading the Latin diagnoses. We are especially indebted to Dr. habil P. Hanelt, head of the taxonomic department of IPK Gatersleben, for the permanent interest in our work, for valuable discussions and critically reading the manuscript.

5 References

- FRITSCH R.M. (1990): Lectotypifications in *Allium* L. (Alliaceae) subg. *Melanocrommyum* (WEBB et BERTH.) ROUY. — *Taxon* **39**: 501-510.
- FRITSCH R. (1990): Bericht über Sammelreisen in Tadschikistan (1983-1988) zum Studium von mittelasiatischen Vertretern der Gattung *Allium* L. — *Kulturpflanze* **38**: 363-385.
- FRITSCH R.M. (1992): Infra-subgeneric grouping in subgenus *Melanocrommyum* (WEBB et BERTH.) ROUY. — In: HANELT P., HAMMER K., & H. KNÜPFER (Eds.): The genus *Allium* - taxonomic problems and genetic resources. Gatersleben: 67-75.
- FRITSCH R.M. (1993): Taxonomic and nomenclatural remarks on *Allium* subg. *Melanocrommyum* (WEBB et BERTH.) ROUY sect. *Megaloprason* WDB. — *Candollea* **48**: 417-430.
- FRITSCH R.M. (in preparation): The Iranian species of *Allium* L. subg. *Melanocrommyum* (WEBB et BERTH.) ROUY sect. *Megaloprason* WDB.
- GAFFAROV G. & I. TURAKULOV (1991): Novyj vid luka (*Allium*) iz Turkestanskogo khrebta. — *Uzb. Biol. Zh.* (2): 69.
- KAMELIN R.V. (1973): Florogeneticheskij analiz estestvennoj flory gornoj Srednej Azii. — Leningrad, Izd. Nauka, 356 pp.
- KAMELIN R.V. (1976a): Novyj vid luka (*Allium* L.) iz yuzhnogo Uzbekistana. — *Novosti sist. vishch. rast.* **13**: 42-44.
- KAMELIN R.V. (1976b): Novyj vid luka iz khrebta Syrdar'inskogo Karatau (Kazakhstan). — *Byull. Mosk. obshch. izpit. priro.*, n. s. **81**: 138-139.
- KAMELIN R.V. (1980): Novye taksony roda *Allium* (Alliaceae). — *Bot. Zh.* **65/10**: 1459-1465.

- KHASSANOV F.O. (1992): A revision of the genus *Allium* L. in the flora of Uzbekistan. — In: HANELT P. HAMMER K. & KNÜPFER H. (Eds.): The genus *Allium* - taxonomic problems and genetic resources. Gatersleben: 153-159.
- KHASSANOV F.O. (in preparation): Conspectus of the wild growing *Allium* species of Middle Asia.
- KHASSANOV F.O. & I.I. MAITZEV (1988): Novyj vid roda *Allium* L. iz Kugitanga. — Uzbek. Biol. Zh. No. 4: 42-43.
- KRASOVSKAJA L.S. & I.G. LEVICHEV (1986): Flora Chatkal'skogo zapovednika. — Izd. Fan, Tashkent, 174 pp.
- KRUSE J. (1994): Rasterelektronenmikroskopische Untersuchungen an Samen der Gattung *Allium* L. IV. — Feddes Repert. 105: 457-471.
- REGEL E. (1868): *Liliaceae*. In: REGEL E. & F.G.M. T von HERDER, Enumeratio plantarum in regionibus cis- et transiliensibus a cl. Semenovie anno 1857 Collectarum ... — Bull. Soc. Imper. Natur. Moscou 41/II: 437-459.
- REGEL E. (1875): *Alliorum adhuc cognitorum monographia* ... Petropolis, 266 pp. (= Acta Horti petrop. 3/2: 1-266.)
- REGEL E. (1887): *Allii species Asiae centralis in Asia media a Turcomania desertisque aralensibus et caspicis usque ad Mongoliam crescentes* ... — Acta Horti petrop. 10: 279-362.
- SEISUMS A. (1992): On three little-known *Allium* L. species (subgenus *Melanocrommyum* (WEBB et BERTH.) ROUY. — Latv. Zinatnu Akad. Vēstis. B. No. 4: 76-78.
- TURAKULOV I. (1986): Novye vidy luka (*Allium* L.) iz Kuraminskogo khrebt. — Dokl. Akad. Nauk Tadzh. SSR 29/3: 180-182.
- VVEDENSKY A.I. (1923): Sem. XX. *Liliaceae*. Lilejnye. — In: POPOV M. G. (Red.) Opredelitel rastenij okrestnosti Tashkenta. Vyp. 1: 55-71.
- VVEDENSKY A.I. (1934): Descriptiones *Alliorum novorum*. — Byull. Sredneaz. gosud. univ. 19/18: 119-130.
- VVEDENSKY A.I. (1935): Rod 267. Luk - *Allium* L. — In: KOMAROV V. L. (Red.) Flora SSSR vol. 4: 112-280.
- VVEDENSKY A.I. (1971): Luk. ... In: VVEDENSKY A. I. (Nauchn. rukov.), KOVALEVSKAYA S. S. (Red.), Opredelitel rastenij Srednej Azii. Kriticheskij konspekt flory vol. 2: 39-89, incl. "Appendix. Descriptiones plantarum novarum in tomo II Conspectus Florae Asiae Mediae commemoratarum": 311-328.
- WENDELBO P. (1971): *Alliaceae*. — In: RECHINGER K. H. *Flora Iranica*. No. 76. Graz, 100 pp.

Address of the authors: Dr. Furkat O. KHASSANOV,
Institute of Botany, Academy of Sciences of the Republic Uzbekistan,
ul. F. Khodzhaeva, 32, 700143 Tashkent, Akademgorodok,
Republic Uzbekistan.

Dr. Reinhard M. FRITSCH,
Institut für Pflanzengenetik und Kulturpflanzenforschung,
Corrensstr. 3, D-06466 Gatersleben, Germany.



1



2



3



4



5



6

Figs. 1-6: Inflorescences and plants at anthesis of *Allium* species. Fig. 1: *A. aroides* VVED. (TAX 2517); fig. 2: *A. gypsaceum* M. POP. et VVED. (TAX 2183); fig. 3: *A. sergii* VVED. (TAX 3680); fig. 4: *A. karataviense* REGEL (TAX 2989, from Chatkal Mts.); fig. 5: *A. backhousianum* REGEL (TAX 3337); fig. 6: *A. collis-magni* R. KAM. (TAX 3655).



7



8



9



10



11



12

Figs. 7-12: Inflorescences of *Allium* species. Fig. 7: *A. zergericum* KHASS. et R. M. FRITSCH (TAX 2992); fig. 8: *A. sewerzowii* REGEL s. str. (TAX 3358); fig. 9: *A. severtzovioides* R. M. FRITSCH (TAX 2522); fig. 10: *A. tashkenticum* KHASS. et R. M. FRITSCH (TAX 3354); fig. 11: *A. taeniopetalum* M. POP. et VVED. (TAX 3361); fig. 12: *A. suworowii* REGEL (TAX 3788).



13



14



15



16



17



18

Abb. 13-18: Inflorescences of *Allium* species. Fig. 13: *A. rosenorum* R. M. FRITSCH (TAX 1886); fig. 14: *A. jesdianum* BOISS. et BUHSE (TAX 3951); fig. 15: *A. hissaricum* VVED. (TAX 2935); fig. 16: *A. cupuliferum* REGEL (TAX 3708); fig. 17: *A. majus* VVED. (TAX 3363, in fruiting stage); fig. 18: *A. giganteum* REGEL (without No., in fruiting stage).